Microsoft Virtual Academy

Module 6

Implementing Failover Clustering with Hyper-V

Microsoft

Module Overview

Configuring and Using Shared Storage

- Implementing and Managing Failover Clustering with Hyper-V

Lesson 1: Configuring and Using Shared Storage

Storing A Virtual Machine on an SMB 3.0 Shared Folder

Using Scale-Out File Server

Shared Storage for Clustering

- Using Virtual Hard Disk Sharing as Shared Storage

Storing A Virtual Machine on an SMB 3.0 Shared Folder

- Hyper-V supports SMB 3.0 or newer
  - Hyper-V uses file share is used as cluster shared storage
  - Continuously available shares are recommended
- All virtual machine storage can be on an SMB share
  - Configuration, virtual hard disks, checkpoints
- SMB Share – Applications profile should be used
  - No access-based enumeration or share caching
- Full permissions on NTFS folder and SMB share
  - Hyper-V administrators

Using Scale-Out File Server

- File server role cluster can work in two modes:
  - Scale-out file server cluster
  - File server cluster for general use
- Benefits of scale-out file server cluster:
  - Active-Active file shares
    - Increased bandwidth
  - CHKDSK with zero downtime
  - CSV cache
  - Simple management
  - Automatic scale-out rebalancing
    - Clients redirected to the best node for access to a share
    - Avoids unnecessary traffic redirection

Using Virtual Hard Disk Sharing as Shared Storage

- A failover cluster runs inside virtual machines
- A shared virtual disk used as a shared storage
  - Virtual machines do not need access to iSCSI or FC SAN
  - Presented as virtual SAS disk
  - Can be used only for data
- Requirements for shared virtual disk
  - Virtual hard disk must be in .vhdx format
  - Connected by using a virtual SCSI adapter
  - Stored on a scale-out file server or CSV
- Supported operating systems in a virtual

Lesson 2: Implementing & Managing Failover Clustering with Hyper-V

Overview of Failover Cluster

Configuring Highly Available Virtual Machines

Virtual Machine Monitoring

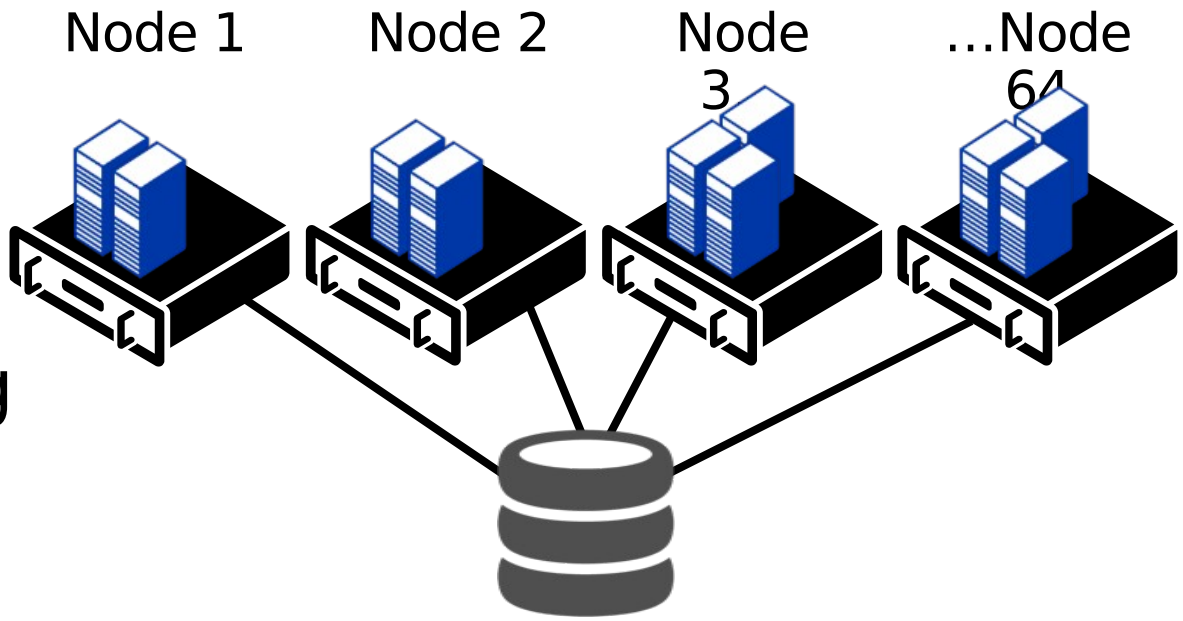
What Is the Hyper-V Replica Broker Role?

- What Is CAU?
- What is Live Migration?

Overview of Failover Cluster

vmware **Compares with** VMware HA

- Up to 64 physical servers and 6,000 VMs
- Built-n hardware and software validation
- Shared storage using SMB, iSCSI, Fibre Channel, Fibre Channel over Ethernet (FCoE) or Serial-Attached SCSI (SAS)



Cluster Shared Volumes (CSV) on Shared Storage

Configuring Highly Available Virtual Machines

- High Availability Wizard
  - Virtual machine storage is on shared storage
    - CSV or SMB 3.0 continuously available share
- Virtual machine startup priority
  - Higher priority is started before lower priority
  - No auto start, must restart manually after failover
- Preferred owners
  - Virtual machine will start on preferred Hyper-V host
  - Start on possible owner only preferred owners are unavailable
  - If preferred and possible owners are unavailable, virtual machine will move to other failover cluster node, but not start

Configuring Highly Available Virtual Machines

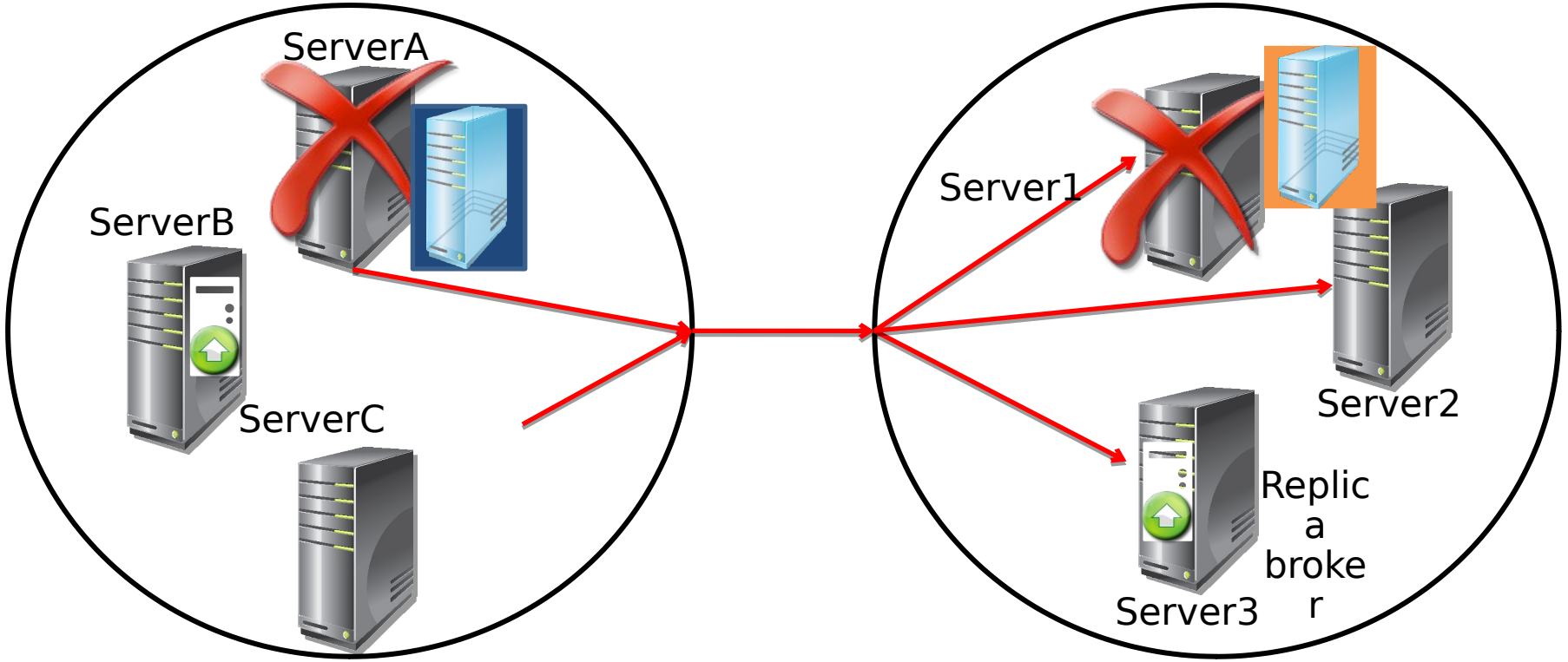
- AntiAffinityClassNames
  - Clustered roles in same AntiAffinityClassNames avoid same cluster node
  - Prevents virtual machines from running on the same node
  - Configured in Windows PowerShell or System Center 2012 Virtual Machine Manager
- Options to modify failover and failback settings
  - Number of times to restart a clustered role
  - Prevent failback of the clustered role to preferred node
  - Virtual machine Policies settings
  - Virtual machine Heartbeat monitoring
    - Requires integration services in virtual machine

Virtual Machine Monitoring

Compares with
VMware App HA

- Application health detection in virtual machine
  - Monitor services through Service Control Manager
    - Configure service recovery to take no action
  - Monitor events in System, Application, or Security logs
  - Windows Server 2012 or newer required
- Configurable recovery actions
  - Restart service
  - Restart virtual machine
  - Fail over virtual machine
- Virtual machine network and storage protection

What Is the Hyper-V Replica Broker Role?

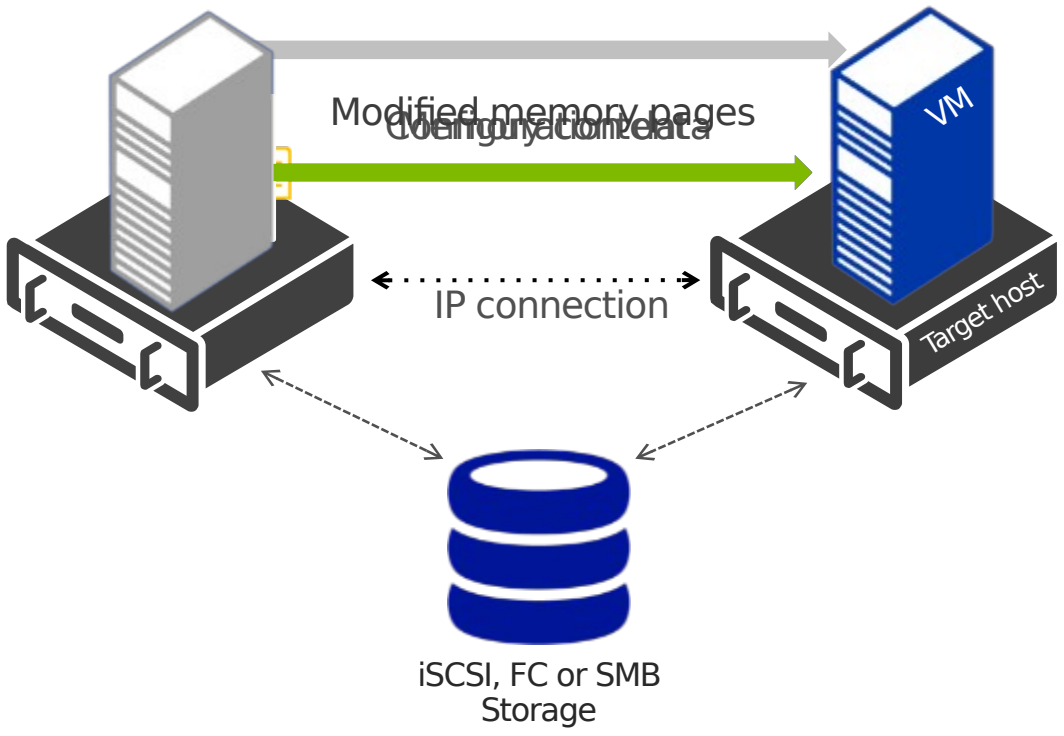


Failover cluster 1

Failover cluster 2

What is Live Migration?

- Utilizes available CPU resources on the host to perform compression
- Compressed memory sent across the network faster
- Operates on networks with less than 10 gigabit bandwidth available
- Enables a 2X improvement in Live Migration performance



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End of Day 1

Course Summary

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Summary

- What have we learned about Hyper-V?
  - Host & Virtual Machine Configuration with inbox tools
  - Resilient Hyper-V Infrastructure with Failover Clustering
  - Virtual Machine Migration, Backup & Replication
- What will we learn about System Center?
  - Hyper-V Host & Cluster Deployment & Configuration with VMM
  - Managing Storage & Networking with VMM
  - Templates & Service Templates
  - Value-Add of Remaining System Center Components

Resources

- Hyper-V Overview - http://technet.microsoft.com/library/hh831531
- Competitive Advantages of Hyper-V - http://download.microsoft.com/download/E/8/E/E8ECBD78-F07A-4A6F-9401-AA1760ED6985/Competitive-Advantages-of-Windows-Server-Hyper-V-over-VMware-vSphere.pdf
- Technical Documentation | Virtual Machine Manager: http://www.microsoft.com/en-us/download/details.aspx?id=6346
- Technical Documentation | App Controller: http://www.microsoft.com/en-us/download/details.aspx?id=29694
- Technical Documentation | Operations Manager: http://www.microsoft.com/en-us/download/details.aspx?id=29256
- Technical Documentation | Data Protection Manager: http://www.microsoft.com/en-us/download/details.aspx?id=29698
- Technical Documentation | Service Manager: http://www.microsoft.com/en-us/download/details.aspx?id=27850
- Technical Documentation | Orchestrator: http://www.microsoft.com/en-us/download/details.aspx?id=29258
- Cloud Services Process Pack Download: http://www.microsoft.com/en-us/download/details.aspx?id=36497

Next Steps

- Come back tomorrow!
- Download evaluation software
  - http://aka.ms/CampEval
- Learn more
  - http://aka.ms/CampMVAWS
  - http://aka.ms/CampMVASC
  - http://www.microsoft.com/learning/en-us/course.aspx?ID=20409A&Locale=en-us
- Get certified
  - http://www.microsoft.com/learning/en-us/exam.aspx?id=74-409

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